

# Predictive Plant Phenomics

## **GRADUATE STUDENT HANDBOOK**

Fall 2019

IOWA STATE UNIVERSITY.

Welcome to the Predictive Plant Phenomics specialization at Iowa State University!

This student handbook is provided to give you general guidance about important issues related to your graduate career. Because the Predictive Plant Phenomics graduate program specialization and traineeship continually seeks to improve, some changes may occur. Students will be alerted to changes and these changes will be posted on the P3 website at [www.predictivephenomicsinplants.iastate.edu](http://www.predictivephenomicsinplants.iastate.edu). You should stay in close communication with the P3 program coordinator and your major professor regarding important curriculum and policy issues. We also encourage you to bring questions and comments to the P3 leadership team at any time.

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# I. Introduction

## ***Predictive Plant Phenomics (P3) Graduate Program Specialization & Traineeship***

The Predictive Plant Phenomics (P3) Program at Iowa State University is an interdisciplinary graduate specialization offering outstanding opportunities for graduate study and research.

Students in this specialization have the opportunity to conduct research in all major research areas of predictive plant phenomics, including genomics, mechanical engineering, electrical and computer engineering, and computational systems biology, with access to some of the most modern experimental platforms.

P3 students are trained to develop an independent and creative approach to science through a highly interdisciplinary curriculum and research projects that include both novel biological and computational/mathematical components. First-year students are appointed as research assistants and have the opportunity to do research exploration rotations in various laboratories to gain experience in both "wet" and "dry" lab environments before selecting the laboratory in which to do their graduate research. Students can participate in up to four rotations to find the lab with the best fit for their research interests. In the second year, students initiate a thesis research project under the guidance of their major professor. P3 students are encouraged to participate in internships with academic or industrial partners during their degree program. Various opportunities will be coordinated by the P3 program and will be offered on a competitive basis.

General information about the P3 program is available on our website at [www.predictivephenomicsinplants.iastate.edu](http://www.predictivephenomicsinplants.iastate.edu). This site also provides links to a directory of P3 affiliated faculty and their research interests as well as links to homepages for individual faculty and research groups. Enrollment in P3 is limited to doctoral students.

## ***Administration and Contact Information***

Predictive Plant Phenomics program activities are overseen by the Executive Committee and Program Coordinator. Please contact us if you have any questions about the program.

P3 Program Office  
1077 Roy J. Carver Co-Laboratory  
515-294-3945  
P3@iastate.edu

[www.predictivephenomicsinplants.iastate.edu](http://www.predictivephenomicsinplants.iastate.edu)

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Ted Heindel	<a href="mailto:theindel@iastate.edu">theindel@iastate.edu</a>	Mechanical Engineering
Patrick Schnable	<a href="mailto:schnable@iastate.edu">schnable@iastate.edu</a>	Agronomy

## II. Upon Arrival at Iowa State

### **General tips**

To help in the orientation process, new students should:

- *Read this handbook.* Read the section on *Administrative Matters* during your first few days.
- *Register for email.* Email is the P3 program's most important means of communication, so students should register for email as soon as possible, and then check it daily.
- Refer to the following documents and websites regularly and examine them carefully. They contain information about University regulations and requirements for graduation.

### **Graduate Student Handbooks**

- [P3 Graduate Student Handbook](#)
- [Graduate College Handbook](#)
- [ISU General Catalog](#)

### **From the Graduate College**

#### **Orientation Website**

<https://www.grad-college.iastate.edu/student/orientation/>

Comprehensive listing of services for academic concerns, student and community life, campus resources, and international students.

#### **Links to Important Dates and Deadlines**

<https://www.grad-college.iastate.edu/calendar/>

#### **Miscellaneous forms**

Iowa State Graduate College forms are available online at:

<https://www.grad-college.iastate.edu/student/forms/>

#### **Thesis Manual**

<https://www.grad-college.iastate.edu/thesis/>

### **From Iowa State University**

#### **Miscellaneous forms**

Additional Iowa State University forms are available online at:

<http://www.ats.iastate.edu/forms.html>

- Other useful references include:

***ISU General Catalog***

<http://catalog.iastate.edu/>

***Schedule of Classes***

<http://classes.iastate.edu/>



<https://accessplus.iastate.edu/frontdoor/login.jsp>

Iowa State University's AccessPlus is a personalized secure university information resource that provides on-demand accessibility to your confidential information. Much university business for students can be handled through their AccessPlus accounts.

***Iowa State University Phone/Email Directory***

<http://www.info.iastate.edu/>

The online directory is updated regularly throughout the year.

***Information Technology (IT) at ISU***

<https://www.it.iastate.edu>

Register for your Net-ID; register your devices; obtain your CyMail account.

IT also provides file storage through Cy-Box, hardware checkout, and computer repair.

High performance computing resources are available through IT

<http://www.hpc.iastate.edu/>.

The IT Solution Center is located in 192 Parks Library; phone: 294-4000.

***Academic On-Line Calendars***

<http://www.registrar.iastate.edu/calendar/>

## III. Getting Started – The First Year

### ***Graduate Student Orientation***

For new graduate students, the academic year begins with a Graduate Student Orientation Week designed to ease the transition to graduate study at Iowa State. This is a time to become acquainted with your major program and its members and to prepare for registration and the start of classes. In addition to participating in the major degree orientation events, students also will take part in orientation activities offered by the Graduate College and International Student and Scholars Office. Students should refer to all schedules for information about Orientation activities.

Students new to P3, even if not new to ISU, are required to attend the two-week P3 Boot Camp which is scheduled to coincide with orientation activities across the university. The purpose of the boot camp is to build a foundation of knowledge for the three disciplinary domains of engineering, data science and plant science. This will serve as a leveling mechanism to ensure all incoming P3 students are prepared for the core curriculum.

Students admitted to the program fall into one of two categories:

- *First year students*  
New students who receive a NSF NRT scholarship are supported during the first year must also enter into the P3 specialization. After their first year, students who receive the P3 scholarship will be supported by their major professor or home department; P3 will assist in finding funding for students after their first year. Students who enter the P3 specialization without support from the P3 scholarship must find funding through their home department. All P3 students spend the first year taking classes, doing research exploration rotations (up to four), and choosing a major professor. New students may not have a "home department" until after they complete their rotations and choose a major professor, usually before the end of their second semester on campus. The student's home department is the same as that of his/her major professor.
- *Current ISU students*  
Students admitted to P3 as trainees, are supported by their major professor and/or home department throughout their graduate career. Those students who receive P3 scholarships are supported by their major professor and/or home department at the end of the scholarship period. Students spend their first year as P3 trainees initiating an interdisciplinary research project, taking classes, and exploring potential POSC members. Regardless of P3 scholarship status, all trainees receive help from their major professors in choosing courses to fulfill the home program requirements and the P3 program coordinator ensures each student fulfills the requirements of the P3 program. The student's home department is the same as that of his/her major professor. Students can add the P3 specialization at any time in their graduate career, but must meet all course requirements before the specialization will be recognized on their transcript.

## ***Registration for Classes***

During Graduate Student Orientation week, students meet with the P3 program coordinator and their major professors for counseling and preparation of class schedules for the upcoming semester. After consulting with advisors, students can register for classes through their AccessPlus accounts. If changes in course registration are necessary, course adds and drops, section changes and credit changes can be made on **ACCESSPLUS** until the end of the first week of classes.

After the first week of classes, changes in class schedules must be submitted on a *Request for Schedule Change or Restriction Waiver* form (better known as an *Add/Drop Slip*), which is available from the major program office or from advisors. Once signed, this form needs to be taken to Room 10 Enrollment Services Center to formalize the change(s).

Students can register for future semesters through **ACCESSPLUS** after meeting with their advisor to plan their schedules. Register for classes before the beginning of the semester to avoid late registration charges. There are also charges for schedule changes after the first week of classes.

## ***Research Exploration Rotations***

An important aspect of the P3 training program is participation in Research Exploration Rotations. The rotations serve several purposes. They are designed to help students choose their future major professors and to help professors choose graduate students. In addition, exploration rotations provide students an opportunity to actively participate in research projects of P3 faculty laboratories and promote interaction and exchange of information among P3 research groups. Because rotations are necessarily brief, students are not usually able to "complete" a project. Instead, during the research exploration rotation period, students should:

- get to know the professor and the students and postdocs working in the research group;
- learn as much as possible about the professor's research projects;
- obtain "hands on" experience in one of the group's research projects;
- attend research group meetings and journal club meetings; and
- read reprints, reviews, and grant proposals related to the group's research.

It is appropriate for a rotating student to ask the rotation advisor whether the advisor would consider accepting him/her as a graduate student, but the final decision should not be made until all three (or four) rotations have been completed.

Participation in research exploration rotations is required for all first year P3 students: three rotations are required and a fourth rotation is optional. Students are strongly encouraged to participate in rotations in at least two different departments.

Beginning in Orientation Week, students should take advantage of and make opportunities to meet individual faculty members and discuss their research. Students should arrange appointments with the professors whose work interests them most.

Students should make use of the following resources in selecting research groups and professors with whom to rotate:

- homepages of individual [P3 faculty](#) (see P3 website);
- discussions with individual faculty members. (This is very important.) Faculty can provide curriculum vitae, recent publications and grant proposals;
- research talks given by P3 affiliated faculty in the various departmental seminars on campus;
- discussions with current P3 graduate students, and
- special orientation week events:

Students should personally contact the faculty members to determine whether they are accepting rotation students and to schedule a rotation.

Typically, the length of each rotation is approximately eight weeks. **Adherence to the following timetable is strongly recommended. It is critical that students choose a major professor and notify the P3 office of their choice on or before the deadlines indicated.**

<b>LAB EXPLORATION ROTATION TIMETABLE</b>	
	Ph.D.
Deadline for Rotation Planning	2 <sup>nd</sup> week of Fall classes
Deadlines for beginning rotations:	
Rotation #1	3 <sup>rd</sup> week of Fall classes
Rotation #2	12 <sup>th</sup> week of Fall classes
Rotation #3	3 <sup>rd</sup> week of Spring classes
Rotation #4	12 <sup>th</sup> week of Spring classes
Deadline for final lab decision	Last week of Spring semester
Deadline for filing Home Department form	See home department

If a student realizes within the first two weeks of a rotation exploration that the rotation experience is not in an area of research he or she wishes to pursue, the student should consult with the P3 program coordinator. The program coordinator will assist the student in scheduling another exploration rotation if assistance is needed.

Students obtain graduate credit for research exploration rotations by registering for the designated course of their home department. To satisfactorily complete these rotations, students must submit a [Rotation Evaluation form](#) for each rotation which briefly describes their work in the rotation. Faculty will use the form designated for faculty to comment on the rotation experience, but students are responsible for faculty filling the form out: students must direct faculty to the form online to fill out. The forms are downloadable from the P3 website under the PROGRAM tab and subpage TRAINEE HANDBOOK.

**All P3 graduate students should aim to register for a total of 12 credit hours each Spring and Fall semester and at least 1 credit hour each Summer semester.** Course credits for research and research rotations are counted within this total. Although research will be conducted during the exploration rotations, **completion of a project is not required.** However, many faculty will use research productivity as one measure by which they determine whether to offer a student the opportunity to join their laboratory. It is therefore important to allow sufficient time in your schedule to actively engage in the intellectual activities of your host lab.

### ***Direct Admissions***

There may be special circumstances when a faculty member would like an applicant to join his or her lab directly without the student taking part in rotations. In these cases, the faculty member and student must provide a plan to the P3 program coordinator outlining the cross-disciplinary training the student will receive which is equivalent to a rotation.

### ***Choosing a Major Professor***

Much of the first year will be devoted to selecting a major professor. After completing research exploration rotations, students should contact their potential major professors to discuss the possibility of joining their laboratories. First-year P3 students must choose a major professor and notify the P3 program office of their choice **by the end of Spring Term.**

#### **NOTE:**

- ***Students should not feel pressured to make a final decision about their future major professor until after all exploration rotations have been completed.*** It is in the student's best interest to reserve a final decision until becoming fully informed about all available opportunities.
- ***It is important for students to discuss their future graduate assistantship support with potential major professors.*** During the exploration rotation period, P3 students who receive the P3 scholarship are supported as Research Trainees with funds provided by the National Science Foundation Research Traineeship (NSF NRT). Students on the NSF NRT P3 scholarship receive 12 months of guaranteed support. After a student has chosen a major professor and beginning in the second year of P3 participation, responsibility for the student's assistantship funding lies with the major professor and home department.

When a P3 affiliated faculty member agrees to serve as a student's major professor, the faculty member is expected to provide or arrange assistantship - Research Assistant (RA) or a Teaching Assistant (TA) - support for the remainder of the student's degree program, as long as the student remains in good standing and is making good progress toward the degree. Professors may not be able to "guarantee" a specific source of graduate assistantship (i.e., RA or TA) support for the student's remaining time; therefore, it is important that a student take an active role in discussing future funding with their major professor. In some cases, students receive support from other sources, such as scholarships or competitive research assistantships.

## **Appointing a Program of Study (POS) Committee**

After choosing the major and co-major professors and establishing a home department, students should begin planning a suitable program for completion of their graduate coursework. Before the end of the first year, students should determine the remainder of their Program of Study (POS) Committee (also referred to as POSC) members through discussions with their major and co-major professors (if applicable). One form will be filed electronically with the Graduate College to form the POS Committee and report the courses the student will take to complete their graduate coursework or POS. The composition and responsibilities of the POS committee are in accordance with the Graduate College guidelines (see below).

The POS committee should include faculty whose knowledge and research interests can aid and complement the student's research interests, as well as faculty whose expertise will ensure a breadth of knowledge on the committee. The POS committee must consist of at least five members of the Graduate College Faculty – including the major professor and co-major professor (if applicable). The committee must have at least three faculty members who are affiliated with the P3 program: one from each core discipline of engineering, data science and plant science. One member of the committee must be from a different field of emphasis so as to ensure diversity of perspectives.

<b>P3 PROGRAM GRADUATE COLLEGE REQUIREMENTS FOR COMPOSITION OF PROGRAM OF STUDY COMMITTEES*</b>		
Below are listed the current minimum requirements for the composition of Program of Study Committees. The rules are established by the Graduate College, but are listed below for students in P3. See the Graduate College Handbook for more details: <a href="http://www.grad-college.iastate.edu/common/handbook/">http://www.grad-college.iastate.edu/common/handbook/</a> .		
		Ph.D.
Major Professor	P3 affiliate faculty member	1
Co-Major Professor (optional)	No Restrictions*	1
Third Member	P3 affiliate of second focus	1
Fourth Member	P3 affiliate of third focus	1
At least one member	Different Field of Emphasis	1
Additional Members (optional)	No Restrictions*	
<b>Total Members</b>		<b>5</b>
* At least 5 POS committee members must be members of the Graduate Faculty.		

After decisions about the committee and coursework are made, file the electronic POSC form. Your major program should be listed as “Major”; home department (major professor’s department) should be listed as “Department.” **You should select “predictive plant phenomics” as the degree specialization.** The form will route from the committee to the Program Coordinator of your home program and the Director of Graduate Education (DOGE) for your major. Once approved, the form will route to the Graduate College. You should let the P3 program coordinator know when your form has been approved.

### ***P3 Program Annual Student Review***

Continued membership in the P3 program and financial support during the P3 scholarship period is contingent upon satisfactory progress towards the degree. To ensure that satisfactory progress is being made, an appointment should be made each semester with the P3 program coordinator to discuss coursework; but, research and professional development may also be discussed. An end-of-year consultation will be scheduled for each student to meet with the P3 executive committee: this is an opportunity for students to share their experiences in P3.

## IV. Academic Matters

### **Academic Calendar**

The P3 graduate training program and specialization is a year-round (12 month) program that includes Fall, Spring and Summer semesters. **Students are expected to be registered and to participate in research and/or courses twelve months per year.** A rotating student may take vacation with the approval of his or her temporary advisor and by notifying the P3 program coordinator. **Each student must obtain the required approval and notify the P3 office prior to travel,** in order to avoid potential interruption of graduate assistantship support and/or visa problems. See *Leave* in the *Benefits* section of this Handbook for information regarding vacation.

### **Research Expectations**

P3 students are trained to develop an independent and creative approach to science through an integrated curriculum and interdisciplinary research projects in the fields of engineering, data science, and plant science.

According to the [Graduate College Handbook](#):

*“A doctoral dissertation must demonstrate conclusively the ability of the author to conceive, design, conduct, and interpret independent, original, and creative research. It must attempt to describe significant original contributions to the advancement of knowledge and must demonstrate the ability to organize, analyze, and interpret data. In most instances, a dissertation includes a statement of purpose, a review of pertinent literature, a presentation of methodology and results obtained, and a critical interpretation of conclusions in relation to the findings of others. When appropriate, it involves a defense of objectives, design, and analytical procedures. Dissertation research should be worthy of publication and should appear in appropriate professional journals or in book form.*

*Since satisfactory completion of the thesis or dissertation can constitute one of the most gratifying experiences in graduate study, the document should reflect the highest standards of scholarship, serving as a measure of quality for the student, major professor, the program, and Iowa State University.*

*Responsibility for writing and editing of the thesis or dissertation rests with the student, under the supervision of the major professor, and not with the Graduate College. The Graduate College does not permit joint authorship of theses or dissertations. It is the responsibility of the major professor to supervise the preparation of preliminary and final drafts of the thesis or dissertation, so as to assure the highest level of quality when the student presents the thesis or dissertation to the committee for final approval.”*

The Graduate College Thesis Website has much information on requirements, fees, and other pertinent information (<http://www.grad-college.iastate.edu/current/thesis/>).

**Required Core Courses**

Core P3 courses cannot be taken PASS/NOT PASS. The M E 600 course is designated as S/F such that either a student performs satisfactorily or fails.

**ME/BCB/GDCB 585. Fundamentals of Predictive Plant Phenomics.** (3-3) Cr. 4. F. *Prereqs: Acceptance into the P3 program or instructor permission.* Principles of engineering, data analysis, and plant sciences and their interplay applied to predictive plant phenomics. Transport phenomena, sensor design, image analysis, graph models, network data analysis, fundamentals of genomics and phenomics. Multidisciplinary laboratory exercises.

**GR ST 565. Responsible Conduct of Research in Science and Engineering.** (1-0) Cr. 1. F.S. *Prereq: Graduate classification.* Ethical and legal issues facing researchers in the sciences and engineering.

**BCB/E E/M E/AGRON/GEN/ENG 693X. Entrepreneurship for Graduate Students in Science and Engineering.** Cr. 1. S. The overarching objective of this course is to provide graduate students in the science and engineering disciplines an understanding of key topics of starting a technology based company.

**M E 600. P3 Graduate Seminar.** R. F.S. P3 Graduate Seminar (P3 trainees select and attend four P3 relevant seminars each semester, for four semesters). Section P3 or C.

**\*STAT 430. Empirical Methods for the Computational Sciences.** (3-0) Cr. 3. F. *Prereq: STAT 330 or an equivalent course, MATH 166, knowledge of linear algebra.* Statistical methods for research involving computers; exploratory data analysis; selected topics from analysis of designed experiments - analysis of variance, hypothesis testing, interaction among variables; linear regression, logistic regression, Poisson regression; parameter estimation, prediction, confidence regions, dimension reduction techniques, model diagnostics and sensitivity analysis; Markov chains and processes; simulation techniques and bootstrap methods; applications to computer science, bioinformatics, computer engineering - programs, models and systems as objects of empirical study; communicating results of empirical studies. Statistical software: R.

*\*Can be substituted for a combination of STAT 587 + (STAT 402 or STAT 588 or STAT 581 or AGRON 526)*

All Trainees Take:	
Semester	
<b>Fall I</b>	Empirical Methods for the Computational Sciences ( <a href="#">STAT 430</a> ) 3 cr (requires permission of the P3 Program Curriculum Committee) - or Statistical Methods for Research Workers ( <a href="#">STAT 587</a> ) 4 cr <b>AND</b> Statistical Design & the Analysis of Experiments ( <a href="#">STAT 402</a> ) 3 cr - or Statistical Methods for Research Workers ( <a href="#">STAT 587</a> ) 4 cr <b>AND</b> Statistical Theory for Research Workers ( <a href="#">STAT 588</a> ) 3 cr - or Statistical Methods for Research Workers ( <a href="#">STAT 587</a> ) 4 cr <b>AND</b> Analysis of Gene Expression Data for Biol. Sci ( <a href="#">STAT 581</a> ) 3 cr - or Statistical Methods for Research Workers ( <a href="#">STAT 587</a> ) 4 cr <b>AND</b> Field Plot Technique ( <a href="#">AGRON 526</a> ) 3 cr

<b>Fall I</b> (continued)	P3 Graduate Seminar ( <a href="#">ME 600 sec P3 or 3</a> ) R Fundamentals of Predictive Plant Phenomics ( <a href="#">ME/BCB/GDCB 585X</a> ) 4 cr Technical Elective (in one of the three discipline areas)
<b>Spring I</b>	Responsible Conduct of Research in Science and Engineering ( <a href="#">GR ST 565</a> ) 1 cr P3 Graduate Seminar ( <a href="#">ME 600 sec P3</a> ) R Technical Elective (in one of the three discipline areas) Technical Elective (in one of the three discipline areas)
<b>Fall II</b>	P3 Graduate Seminar ( <a href="#">ME 600 sec P3</a> ) R Technical Elective (in one of the three discipline areas) Technical Elective (in one of the three discipline areas)
<b>Spring II</b>	Entrepreneurship for Graduate Students in Science and Engineering (BCB 590 sec 3) 1 cr P3 Graduate Seminar ( <a href="#">ME 600 sec 3</a> ) R Technical Elective (in one of the three discipline areas)

### **Technical Electives**

There are three disciplines in which P3 students take elective courses: engineering, plant sciences and data sciences. These are broad disciplines which include a number of departments and variety of courses. P3 students are required to take three technical electives in the discipline they choose as their focus, two courses in the discipline of their secondary focus, and one course in the remaining discipline.

Engineering Technical Electives Examples	
Fall	Integrated Transport Phenomena ( <a href="#">CHE 554</a> ) Transport Phenomena I ( <a href="#">CHE 356</a> ) Instrumentation for Ag & Biosystems Engineering ( <a href="#">ABE 504</a> ) Biosensors ( <a href="#">BME 450</a> ) Electronics, Microelectronics, & Photonics ( <a href="#">EE 530</a> ) Fundamentals of Remote Sensing ( <a href="#">CRP 454</a> )
Spring	Digital Image Processing ( <a href="#">EE 528</a> ) Advanced Machine Learning ( <a href="#">ME 517</a> ) Modeling and Simulation ( <a href="#">ME 475</a> ) Data Analytics and Machine Learning for Cyber-Physical Systems Applications ( <a href="#">ME 592X</a> ) Advanced Topics ( <a href="#">ABE 690</a> )
Plant Sciences Technical Elective Examples	
Fall	Plant Molecular, Cell and Developmental Biology ( <a href="#">GDCB 545</a> ) Plant Metabolism ( <a href="#">GDCB 513</a> ) Crop Genetics ( <a href="#">AGRON 506</a> ) Molecular Biology of Plant-Pathogen Interactions ( <a href="#">PLP 692</a> )

	Population & Quantitative Genetics for Breeding ( <a href="#">AGRON 561</a> ) Principles of Cultivar Development ( <a href="#">AGRON 521</a> ) Applied Plant Molecular Genetics & Biotechnology ( <a href="#">AGRON 524</a> ) Introduction to Plant Breeding ( <a href="#">AGRON 421</a> ) Transmission Genetics ( <a href="#">GDCB 510</a> ) Molecular Virology ( <a href="#">PL P 608</a> ) Plant Metabolism ( <a href="#">PLBIO 513</a> ) Principles of Plant Pathology ( <a href="#">PI P 508</a> )
Spring	Molecular Genetics ( <a href="#">GDCB 511</a> ) Global Change ( <a href="#">AGRON 504</a> ) Bacterial-Plant Interactions ( <a href="#">PL P 477</a> ) Crop Physiology ( <a href="#">AGRON 516</a> ) Quantitative Genetics for Plant Breeding ( <a href="#">AGRON 528</a> ) Principles of Plant Pathology ( <a href="#">PI P 508</a> )
<b>Data Sciences Technical Elective Examples</b>	
Fall	Software Tools for Large Scale Data Analysis ( <a href="#">CPR E 419</a> ) Pattern Recognition ( <a href="#">E E 547</a> ) Principles of Artificial Intelligence ( <a href="#">COM S 572</a> ) Algorithms for Large Data Sets: Theory & Practice ( <a href="#">COM S 535</a> ) High Performance Computing for Science & Engineering Applications ( <a href="#">CPR E 425</a> ) Bioinformatics Algorithms ( <a href="#">BCB 567</a> ) Fundamentals of Remote Sensing ( <a href="#">C R P 454</a> ) GIS Programming and Automation ( <a href="#">C R P 456</a> ) Fundamentals of Bioinformatics ( <a href="#">GDCB 544</a> )
Spring	Computational Functional Genomics and Systems Biology ( <a href="#">BCB 570</a> ) Statistical Bioinformatics ( <a href="#">BCB 568</a> ) Bioinformatics Algorithms ( <a href="#">BCB 567</a> ) Computational Skills for Biological Data ( <a href="#">EEOB/BCB 546X</a> ) Evolutionary and Ecological Genomics ( <a href="#">EEOB 561</a> ) Machine Learning ( <a href="#">COM S 573</a> ) Applied Modern Multivariate Statistical Learning ( <a href="#">STAT 502</a> ) Exploratory Methods and Data Mining ( <a href="#">STAT 503</a> ) Statistical Methods for Spatial Data ( <a href="#">STAT 406</a> ) Fundamentals of Systems Biology and Network Science ( <a href="#">BCBIO 402</a> ) Data Analytics and Machine Learning for Cyber-Physical Systems Applications ( <a href="#">M E 592X</a> )

The courses listed in the table above can be found on the P3 website also, and are not necessarily a comprehensive list. Any course that a student deems valuable to their education in predictive plant phenomics may be submitted to the P3 program coordinator for review by the P3 Curriculum Committee. This committee convenes twice a semester so it is important to submit requests for course review as soon as a candidate course is found. The Graduate College has limits on the number of credits accepted from -300 and -400 level courses, so students need to consider these [quotas](#) when choosing coursework.

## ***Required Seminars and Activities***

### ***Boot Camp***

All new P3 scholarship recipients must attend the P3 Boot Camp following admission into the P3 specialization. Students will not be considered “in good standing” until the next available Boot Camp is completed. The P3 Boot Camp is held annually in the two weeks preceding the start of the fall semester. Students in the P3 specialization, but without the P3 scholarship, are highly encouraged to participate in the P3 Boot Camp.

### ***Symposia***

Each Fall, P3 students organize a symposium around a topic of their choosing that touches on some aspect of predictive phenomics in plants. Students lead all aspects of the planning, organization and delivery of the symposium. The P3 program coordinator will be available as a resource for information, direction and policy. Students who are registered as officers of the P3 Graduate Student Organization (P3GSO) should compose the organizing committee.

### ***Seminars***

Students are required to take *M E 600* for four consecutive semesters. For the Fall semester, students register for the section *P3*. For the Spring semester, students register for the section 3.

- To pass this course, you must attend four seminars that present information related to predictive plant phenomics and take handwritten notes on the content of the presentation. Notes are to be submitted via Canvas. Seminars that are required by your major degree program cannot be used to satisfy the four seminar requirement of *M E 600*. This is to ensure that students are being exposed to information outside of their major program and research focus.
- Failure to attend and turn in the notes for four seminars will result in a NOT PASS grade and ultimately put the student in bad standing in the P3 program. A student who is not in good standing in the P3 program will not have access to travel or research grants. A NOT PASS grade can be changed after an additional 4 seminars are attended the following semester (in addition to the 4 required for the *M E 600* course for that semester, for a total of 8 seminars).

## ***Additional Research Training Opportunities***

### ***Participation in Scientific Conferences and Symposia***

An essential part of graduate training is attendance at and participation in research conferences. Students should attend at least one national or international meeting during their degree program. All P3 students are eligible for financial assistance from P3 (as well as from other ISU sources) for conference-related expenses, but only for conferences held in the United States. Travel money cannot be awarded for international conferences. For additional information, see [Grants for Professional Travel](#) in [Section VII. Financial Matters](#).

### ***Internships***

P3 students are encouraged to participate in industrial internships as part of their training for careers in industry, government or the public sector. For additional information, please contact the P3 program coordinator ([p3@iastate.edu](mailto:p3@iastate.edu)).

### International Experiences

P3 students are encouraged to enrich their educational experience and establish international contacts by participating in international research experiences. P3 affiliated faculty have working relationships with institutions around the world and in with which international training experiences have been arranged in the past. Speak with your major professor about arranging these opportunities. For example, the International Plant Phenotyping Network ([IPPN](#)) is an excellent starting place and offers many opportunities to get involved.

### **P3 Program Grade Requirement**

A minimum grade requirement for the P3 core courses was instituted for students entering in Fall 2019 and beyond. Students must obtain a GPA of 3.0 in the core courses and the minimum grade which is acceptable in these courses is a B-. Any student in the P3 specialization who fails to maintain a cumulative GPA of 3.0 will be allowed a one semester grace period to raise his/her cumulative GPA to 3.0 or above. If the P3 trainee has failed to raise his/her cumulative GPA to 3.0 or above by the end of the following semester, or if the P3 Fellow has a second occurrence of GPA below 3.0, participation in the P3 specialization program will be completely and fully terminated and will not be reinstated.

If an NSF NRT P3 Fellow (i.e., scholarship recipient) fails to maintain a cumulative GPA of 3.0, that Fellow will be allowed a one semester grace period to raise his/her cumulative GPA to 3.0 or above. During this grace period, the P3 Fellow will be responsible for the part of his/her tuition normally paid by the P3 Program Tuition Scholarship, and his/her use of P3 Program travel and research funds will be suspended. If, at the end of the academic probation semester, the P3 Fellow has raised his/her cumulative GPA to 3.0 or above, their NSF NRT P3 Program status will be fully reinstated and the student will be able to use the remaining funds to offset tuition and benefits. If, however, the P3 Fellow has failed to raise his/her cumulative GPA to 3.0 or above, or if the P3 Fellow has a second occurrence of GPA below 3.0, the NSF NRT P3 Program Traineeship will be completely and fully terminated and will not be reinstated.

### **Summary of First Year Course Requirements for P3 trainees**

#### All first-year P3 students must:

- Participate in boot camp in August prior to Fall semester
- Take the required P3 Core Courses;
- Attend *four* seminars to satisfy M E 600 requirement;
- Take a Technical Elective (can simultaneously satisfy a major program requirement).

#### After the First Year, students should

- Register for (*major program*) 69\* (*research credits*) every semester. Number of credits will vary depending on other courses taken; **students should register for no more than 12 credits every Fall and Spring semester, and a total of 1 credits every Summer semester.**
- Register for courses to complete remaining P3 Core Course requirements.
- Attend *four* seminars to satisfy M E 600 requirement each of next two semesters;
- Register for courses to complete remaining Technical Electives requirements.

## V. Progressing through the Degree Program

Forms listed in this section can be found on the Graduate College's website at: [http://www.grad-college.iastate.edu/common/forms/student\\_forms.php](http://www.grad-college.iastate.edu/common/forms/student_forms.php)

### ***First Year Activities***

Activities completed during a student's first year in the P3 program are described in [Section III. Getting Started – The First Year.](#)

### ***Approval of the Program of Study (POS)***

After selection of their major (possibly and co-major) professor(s), students should begin planning a suitable program for completion of the P3 and major program graduate coursework. Forming a POS Committee and filing the Program of Study form are done electronically in one form. The Graduate College *Program of Study/Committee* (POSC) form serves as a contract between the student and the Graduate College, indicating the minimum coursework that must be completed for the Ph.D.

Students should prepare a tentative *Program of Study* in consultation with their major professor and arrange a meeting of their POS committee to discuss the proposed *Program of Study* and research plans. All committee members must be present.

In preparing the *Program of Study*, the student and major professor should refer to the P3 and major program course requirements to ensure that the planned coursework: 1) meets all requirements for both programs, 2) meets all Graduate College requirements, and 3) is appropriate, based on the student's planned research project. Do not include P/F courses on POS. The POS committee will approve the form if these conditions are met.

When choosing your major program in your POSC form, you will have the option of indicating a specialization from a drop-down menu. You will need to select "Predictive Plant Phenomics" in order to add P3 as a specialization and for it to be recorded on your degree transcript.

### ***Transferability of Credits from Other Institutions***

The transferability of credits from other institutions will be determined on a case-by-case basis by the student's POS committee and the P3 Curriculum Committee. To waive an ISU course requirement, students should make their case to their POS committee after meeting with the instructor of the ISU course they wish to waive. If the committee approves, the major professor (on behalf of the POS committee) and the instructor of the course the student wishes to waive should agree the course in question meets the outcomes of the associated ISU course to make sure the student has gained the required skills and/or knowledge. A memo must be written by the major professor and should state that the student has already received satisfactory instruction in the subject matter covered by the required course. Credits for seminars, workshops and colloquia are not transferable.

### **Satisfactory Completion of P3 Courses**

See [P3 Program Grade Requirement](#).

If an **F** or **NP** is received in M E 600, then a student must attend twice the required number of seminars the semester immediately following the semester the unsatisfactory grade was received in order to change the grade to **S** or **PASS**. Continued **F** or **NP** performance may result in dismissal from the P3 degree specialization.

Any unsatisfactory completion of a P3 course will immediately place a P3 student in bad academic standing with P3. Only students in good academic standing are eligible for [research](#) and [travel grants](#).

### **Graduate College Grade Requirements**

A cumulative GPA of at least 3.0 is required by the Graduate College for one-half tuition support by the Graduate College. The grading scale at ISU is as follows: A (4.0), A- (3.67), B+ (3.33), B (3.0), B- (2.67), C+ (2.33), C (2.0), C- (1.67), D+ (1.33), D (1), and F (0). Research grades (699, 697) do not count toward the GPA.

### **Preliminary Examination**

The Graduate College requires that all Ph.D. students pass a Preliminary Examination before advancing to candidacy for the doctoral degree. **The Preliminary Examination meeting should be completed before the end of the first semester of the third year**, but refer to your home department requirements. All POS committee members must be present.

To initiate this process, the student must file a *Request for Preliminary Examination* form (available from department and program administrative offices and the Graduate College). Both the major professor and Program Chair need to sign off on this form.

### **Writing the Dissertation or Thesis**

If research data from other students or researchers is included in the thesis (e.g., the student is one of several co-authors on a manuscript included in the thesis), instructions on how to clearly indicate co-authors' roles in the research and/or preparation of the manuscript is available from the Graduate College. Their website describes electronic theses/dissertation submission and includes links to critical formatting information: <http://www.grad-college.iastate.edu/thesis/homepage.html>

### **Acknowledgement of Funding**

Students who receive federal, university or other funded support must acknowledge such support in their published works. Students who receive a P3 scholarship - who receive a stipend and support from the NSF NRT - must indicate funding support in the acknowledgement section of their dissertation. P3 students who are not scholarship

recipients, but who receive travel or research grants from the P3 program must also acknowledge NSF as a source of support in their dissertation. The grant number is **NRT-DESE 1545453**. Below is from the NSF website and details how to acknowledge NSF support in published materials:

An acknowledgment of NSF support and a disclaimer must appear in publications (including World Wide Web sites) of any material, whether copyrighted or not, based on or developed under NSF-supported projects:

"This material is based upon work supported by the National Science Foundation under Grant No. (grantee must enter NSF grant number)."

NSF support also must be orally acknowledged during all news media interviews, including popular media such as radio, television and news magazines.

Except for articles or papers published in scientific, technical or professional journals, the following disclaimer must be included:

"Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

### ***Annual Review of P3 Student Progress***

**Continued participation in the Predictive Plant Phenomics (P3) program and financial support are contingent upon satisfactory progress towards the degree.** The progress of all students in the P3 program is evaluated each year by the P3 program coordinator. The Annual Review also offers an opportunity for P3 students to provide feedback on the program.

Progress will be evaluated on the basis of the following criteria:

- \* Timely completion of P3 training requirements
- \* Satisfactory performance in laboratory exploration rotations or satisfactory progress in thesis research
- \* Satisfactory performance in required/recommended courses

### ***Application for Graduation***

Students must submit an *Application for Graduation form* to the Graduate College indicating the expected semester of graduation. This form must be completed by *midterm of the semester preceding* the graduation semester. If a student does not graduate at the expected time, a new application must be submitted for a subsequent semester. The Graduate application form is available at <http://www.grad-college.iastate.edu/forms/forms.html>.

## ***Thesis Seminar and Final Examination***

The Final Examination for the Ph.D. degree is an oral defense of the Ph.D. dissertation. This includes a required formal seminar presentation of thesis research to the P3 and major program faculty, students, and other members of the Iowa State academic community.

Students should submit a *Request for Final Examination* form after the dissertation or thesis work has been completed and all the other requirements have been met. After receipt of this form, the Graduate College will send a *Report of Final Examination* form directly to the major professor. The major professor is responsible for bringing this form to the final oral examination.

Students are strongly encouraged to present the final oral seminar as part of a seminar series of their home department. *At least two weeks prior* to the seminar, students should provide the P3 program coordinator with the text of the formal seminar announcement. Seminar posters will be distributed and an email message will be sent to P3 faculty and graduate students announcing the seminar. Following the public seminar (usually, but not always immediately afterwards), an oral examination (closed to the public) will be given by the POS committee. All members of the POS committee must be present at this meeting. This examination will review the dissertation or thesis and the candidate's knowledge of relevant subjects.

## ***After Graduation***

### **Letters of Recommendation**

When letters of recommendation are needed for future employment or grant proposals, students should directly contact faculty to ask whether they are willing to serve as referees. If so, students should provide the following:

- adequate advance notice (*at least three to four weeks*);
- a copy of the job posting or job description;
- a current Curriculum Vitae; and
- an email reminder one week before the recommendation deadline.

It is courteous (and wise) to send referees a complete numbered list of the letters needed, with deadlines clearly indicated AND pre-addressed labels. An electronic copy of this address list is usually appreciated.

## ***Dismissal***

Continuing registration as a graduate student at Iowa State University is contingent upon maintaining good standing in a graduate major. The P3 program specialization expects students to complete their degrees in a satisfactory and timely manner. However, there are certain situations that may require severing the relationship between a student and the P3 program.

### Dismissal Criteria

A student may be dismissed, that is, removed from the degree program and not permitted to receive the P3 specialization on their degree, for the following reasons:

- Failure to progress satisfactorily in his/her degree program

This may be evidenced by a lack of research progress, a lack of aptitude or a failure to maintain satisfactory academic standing, as defined by the Iowa State University *Graduate College Handbook*. It may also occur when a student fails to meet a P3 core course attendance requirement or does not meet the P3 grade requirements (see [P3 Program Grade Requirement](#))

- Lack of a major professor

Because graduate degrees at ISU are centered about a mentored research project, it is impossible to complete a degree without a research mentor (major professor). To maintain good standing and earn a degree specialization in Predictive Plant Phenomics (P3), a student must have a P3-affiliated faculty member serving as major professor.

A student admitted to P3 on rotation has up to 12 months from the date of entry into the degree specialization to find a faculty member willing to serve as his or her major professor (**unless** otherwise designated at the time of admission). If the student desires assistance, P3 will help the student search for a major professor; however, final responsibility for finding a major professor rests with the student.

Occasionally, a faculty member who has agreed to serve as a major professor becomes unable or unwilling to serve. A faculty member who wishes to terminate service as major professor for a P3 student may do so by notifying the student and the P3 program coordinator in writing. A student who has lost his or her major professor has up to three months (after the date the P3 program coordinator was notified) to identify another P3-affiliated faculty member willing to serve. P3 will help the student search for a new major professor, if the student desires.

- Academic dishonesty

The proper conduct of science requires the highest standards of personal integrity. Because of this, the University and P3 consider dishonesty in the classroom or in the conduct of research to be a serious offense. Students accused of academic dishonesty will be dealt with according to the procedures outlined in the *University Catalog* and the *Faculty Handbook*. Possible punishments can include dismissal from the program and expulsion from the University, depending on the severity of the offense.

### Dismissal Procedures

P3 can recommend dismissal of a student from the P3 specialization for any of the reasons listed above. Recommendations for dismissal are made to the P3 Chair and are acted on by the P3 Executive Committee. Dismissal from P3 may not result in dismissal from the university, but it will result in the removal of the P3 specialization from the student's transcript.

Before a dismissal is decided, the P3 Chair must give the student a written notice explaining why dismissal is being considered. The P3 Chair must also discuss the situation with the student – as well as with the POS committee, major professor, and/or temporary advisor – in an attempt to find a satisfactory resolution. If a satisfactory resolution cannot be reached and the student is dismissed, either party may bring the issue to the attention of the Associate Dean of the Graduate College for a decision. The student may appeal the decision of the Associate Dean, as described in the *Graduate College Handbook*.

### Notice of Resignation

When a student completes their degree or decides to leave Iowa State before completion of their degree, they should fill out a Notice of Resignation form and return this to their supervisor. This form will allow your supervisor to know the last day of work, reason for leaving, any additional comments you wish to make, and your forwarding address. This form can be found here: [http://www.hrs.iastate.edu/hrs/files/notice\\_of\\_resignation.doc](http://www.hrs.iastate.edu/hrs/files/notice_of_resignation.doc). The student should also let contacts in their department and in their major know as well. Students may download an Employee Separation Checklist found here: <http://www.hrs.iastate.edu/hrs/node/48>. This form will provide reminders about items such as the turn-in of keys, paying outstanding bills, returning car tags, and where to have W-2s mailed.

### Responsibilities of P3

It is the responsibility of P3 to counsel students who are having academic difficulties, to help students search for an acceptable major professor or, if students are unable to overcome these difficulties, to help the students identify and apply to other appropriate degree programs. It is the responsibility of the major professor and his/her department or interdepartmental program to seek funds for a student's assistantship and for the conduct of research.

### Appeal Process

The University has established appeal processes for student grievances. These vary depending on the nature of the grievance, and are described in the *Graduate College Handbook*. Generally, these procedures begin with the program chair or the appropriate Department Executive Officer. It is usually best for all parties if a satisfactory resolution can be reached without initiating a formal appeal process. The Associate Dean of the Graduate College is available to consult informally with students and faculty.

## VI. Campus Resources

### ***ISU Computer Services/Resources***

Iowa State University has outstanding computational and biological research facilities that support collaborative research groups in the life sciences, bioinformatics and computational biology, computer and information sciences, engineering, and complex adaptive systems.

Some of these resources include:

- *Information Technology (IT) at Iowa State University* -- manages a campus-wide network, which augments the various departmental computing facilities. Major computational research facilities include the Virtual Reality Applications Center, the Scaleable Computing Laboratory, and the Artificial Intelligence, Database, and Distributed Computing Research Laboratories in the Department of Computer Science.

New students should visit here: <https://www.it.iastate.edu/foryou/students/> to learn how to utilize the available computing resources at Iowa State. The Solution Center is located in 192 Parks Library and their phone number is 294-4000.

Laptops, video equipment, digital cameras, film cameras and accessories, PA systems, and other equipment are available for checkout in person at the main lobby of the Communications Building (next door to the Molecular Biology Building). Find more information here: <https://www.it.iastate.edu/services/laptops>.

- *ISU Library* – Find a subject librarian who specializes in your research area at: <http://instr.iastate.libguides.com>.
- *The P3GSO* is a student-led initiative in the P3 Program which provides a forum for the exchange of experience, knowledge, and resources to enhance research activities.

### ***The Graduate College – Professional Development Opportunities***

Developing professional skills is an essential component of a graduate student's career. The Graduate College has identified six essential skills to help graduate students and postdocs become successful in their respective disciplines. The six core competencies are: Career, Communication, Leadership / Management, Research, Teaching, and Wellness.

### ***Graduate and Professional Student Senate (GPSS)***

The Graduate and Professional Student Senate (GPSS) represents the graduate and professional students' perspective on campus issues and serves as a liaison between graduate/professional students and the university administration. Each department/program is permitted to elect or choose 1 Senator for every 50 students in the department up to 5 Senators. Typically, senators are elected by the department's students or are selected by the Graduate Student Organization, if one exists.

For more information, visit: <http://www.grad-college.iastate.edu/gpss/index.html>. The GPSS office is located in the West Student Office Space J, Memorial Union, email: [gpsscio@iastate.edu](mailto:gpsscio@iastate.edu)

### ***Student Counseling***

The mission of the Student Counseling Service (SCS) is to help students enhance their academic and personal well-being. The Student Counseling Service provides prevention, intervention, information, and referral services to Iowa State students. SCS also provides consultation and training to faculty and staff to assist them in addressing the psychological needs of students. Student Counseling Service (SCS) provides a wide range of services to help students gain the most from their college experience. SCS offers career counseling, personal counseling, group counseling, and workshops. Most services provided by SCS are short-term in nature, and SCS can assist students needing long-term assistance with referrals to community services. Some of the typical issues SCS assists students with include career decision-making, coping with relationship problems, low self-esteem, stress, loneliness, depression, cultural differences, sexual assault recovery, trauma, childhood abuse, conflicts over sexuality, substance abuse, eating disorders, academic motivation, and other concerns. Other services include the Substance Abuse Prevention Program, Career Resource Center, Learning Disabilities Screening, Biofeedback Center, Placement Testing, and consultation and outreach services. SCS also provides consultation and training to faculty and staff to assist them in addressing the psychological needs of students. For more information, visit <https://www.counseling.iastate.edu/>

### ***Dean of Students Office (DSO) and Student Assistance Services (SAS)***

Members of the Dean of Students Office (DSO) and Student Assistance Services (SAS) assist students as they manage issues surrounding academic concerns, personal matters/emergencies, and navigation of university policies and procedures. DSO/SAS staff members counsel students on effective ways of filing academic grievances, refer students to university & community resources, provide notification of faculty in emergency absence situations, intervene and follow up with students experiencing mental and physical crises, and provide assistance in understanding the University judicial system. In general, the DSO and SAS are places where students can find answers or start on the path to their own solutions. Student Assistance and Outreach staff are available to meet from 8am-5pm Monday through Friday. To schedule an appointment, stop in to the Dean of Students Office (1010 Student Services Building); or call the office at 515/294-1020 (TTY 515/294-6635). For more information, visit <http://www.dso.iastate.edu/>

## VII. Financial matters

### ***Graduate Appointments and Assistantships***

Students who are awarded the P3 scholarship will receive financial support through the National Science Foundation Research Traineeship (NSF NRT). Students may participate in P3 who are not supported through the NSF NRT; these students must work with their major professors to secure funding over their graduate career. New P3 scholarship students are admitted to the program in one of two categories discussed in [Section III](#). Typically, Ph.D. students receive 10.5 months of guaranteed assistantship support through their major program or major professor. The responsibilities associated with a stipend depend on the type of assistantship (Research Assistantship or Teaching Assistantship). Information about these forms of support is available in the *Graduate College Handbook*.

***It is important for students to discuss their future graduate assistantship support with potential major professors.*** After a major professor has been chosen, the primary responsibility for a student's assistantship funding lies with the major professor and home department. (For administrative purposes, the major professor's department becomes the student's home department.)

All graduate students on assistantships sign a *Graduate Assistantship Letter of Intent* that lists the terms and conditions of their appointment. Generally, graduate assistantship appointments are on a "one-half time" basis. "Half-time" is the maximum time appointment for graduate students; the remaining "half-time" is spent as a student in graduate studies and research. Appointments can be terminated by mutual consent or for reasons as described in the *Graduate College Handbook*. P3 may provide assistance to students in their search for funding support.

The University payday is the last Thursday of each month, with pay deposited directly into students' bank accounts. Direct deposit and any bank account changes can be done on a student's AccessPlus account. Deductions are made for Federal and State income taxes and Social Security, if applicable.

### ***Competitive Fellowships for Enrolled Students***

In addition to the fellowships available for new students entering the P3 program, additional fellowship opportunities also exist for all students specializing in Predictive Plant Phenomics.

Other fellowships provide additional funding on top of the existing amount provided in the assistantship award. A student's home program must nominate a student for these fellowships, but students are encouraged to explore these opportunities. These include

- the Graduate College Scholar Program which provides an award of \$1,000 to \$10,000 per year for up to three years;
- the Miller Graduate Fellowship which provides an award up to \$5,000 per year for 3 years,
- the Brown Graduate Fellowship which provides a \$10,000 grant, and

- the Diane Brandt Graduate Fellowship for women which provides a \$5,000 award
- Dean Kleckner Global Agriculture Graduate Scholarship
- Print and Grace Powers Hudson Scholarship in Agriculture
- AGEP Fellowship is limited to students who identify as a member of a minority group and provides support of \$27,500 for up to 5 years
- George Washington Carver (GWC) Doctoral Fellowship is limited to students who identify as a member of a minority group and provides support of \$27,500 for up to 3 years.

Additionally, there are many fellowship opportunities outside of Iowa State University's funding pool. Check out a sample of these opportunities below and search for other opportunities through government agencies, private organizations, and professional networks. New opportunities are always being created.

- NASA fellowship: <https://intern.nasa.gov/>
- National Science Foundation GRFP: [https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=6201](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201)
- NVIDIA's Graduate Fellowship Program: <https://research.nvidia.com/graduate-fellowships>
- National Defense Science and Engineering Graduate Fellowship Program: <https://www.ndsegfellowships.org/>

### ***Grants for Professional Travel***

Attendance and presentation of research results at professional meetings are an essential part of any graduate training program. Students should attend at least one national or international meeting during their degree program.

Financial assistance is available through *Professional Advancement Grants* from the Graduate College and the Graduate and Professional Student Senate, from major professors and home departments, and from the P3 program. Students interested in attending a conference should:

- discuss conference opportunities with their major professor and ask about the availability of funding provided through the major professor and the home department;
- plan conference attendance well in advance to ensure the best pricing for registration and airfares, and to secure funding;
- complete the *Professional Advancement Grant* (PAG) application for funding from the Graduate College and the Graduate and Professional Student Senate. The form and instructions are on the GPSS site: <https://www-gpss.sws.iastate.edu/students/pag/>
- apply for matching or supplementary funds from the P3 program, using the form on the P3 website: <https://www.predictivephenomicsinplants.iastate.edu/trainee-travel>

Funding is available from the P3 program, on a competitive basis, over the entirety of the student's graduate career while the NSF NRT grant is active. A student will receive a travel award based on demonstrated need and with respect to matching funds, whether non-P3 funds were sought and available funds. An application for travel funding must be submitted BEFORE travel in order for an award to be considered. Recipients of a P3 travel award are expected to take P3 promotional materials to their conference for sharing with attendees.

### Professional Advancement Grants

The Graduate and Professional Student Senate provides funds not only to support attendance at professional meetings, but also to support graduate student research and childcare. Information and forms are available on the GPSS website at <http://www.grad-college.iastate.edu/gpss/>, under *Professional Advancement Grants*.

### **Grants for Research**

Funding for research supplies is available from the P3 program, on a competitive basis, over the student's graduate career, while the NSF NRT grant is active. A student may receive an award if need is demonstrated, matching funds are received or otherwise sought, and funds are available. There are some restrictions on what can be purchased with the research funds: contact the P3 program coordinator for an explanation of the restrictions.

To apply for research funding from the P3 program, fill out the form on the P3 website: <https://www.predictivephenomicsinplants.iastate.edu/traineematerials>

### **Benefits**

#### Student Health Insurance

Single student coverage under the Iowa State University Student Health Insurance Plan is provided free of charge to all graduate assistants at ISU. Insurance sign-up for new students takes place during Orientation. New students should not discontinue any other insurance before ISU coverage begins. Students also can arrange for insurance coverage for their family; this option is available only through payroll deduction. For information, contact the ISU Student & Scholar Health Insurance Program (SSHIP) office at 0570 Beardshear Hall; phone: (515) 294-2394 or email: [isusship@iastate.edu](mailto:isusship@iastate.edu). Their website is at: <http://www.hrs.iastate.edu/sship/>.

All international students, whether on assistantship or not, are required to carry the ISU Student Health Insurance or to be covered by another health insurance policy. For more information, contact the International Student and Scholars office in Suite 250/252 Memorial Union (294-1120).

#### Prescription Drug Benefit Program

Graduate students receive single coverage free of charge in a prescription drug benefit program that reduces the cost of generic and prescription drugs available at the Thielen Student Health Center. For information, contact the Student Health Center Pharmacy (294-7983).

#### Health Service

All students have access to services provided by the ISU Thielen Student Health Center. A mandatory health fee per semester and a health facility fee are assessed to all students registered for five or more credits. This health fee pays for some services offered at the Student Health Center. The health facility fee applies to the cost of the new Student Health Center. The health center fee is optional for students enrolled for fewer than five credits. The health fee can be increased without notice.

Additional information about the student group plan medical insurance and the benefits of the mandatory health fee can be obtained from the Thielen Student Health Center (294-5801). Information about the Student Health Service also is available in the ISU General Catalog and on the web at <http://www.health.iastate.edu/>.

### Leave

During the exploration rotation period, some research assistants with half-time appointments may be eligible to earn vacation at a rate of eight hours per month (equivalent to two calendar days per month). A student may take vacation with the approval of the temporary advisor and by notifying their major program or home department office.

After students' *Home Department* forms are approved, leaves (including maternity/paternity) are handled by the major professors and home departments, which develop and implement their own policies. Vacation time accumulated prior to joining home departments is not carried forward.

The *Graduate College Handbook* states only:

*Arrangements for a leave of absence are made between the graduate assistant and that assistant's supervisor. When a graduate student employee needs to be absent either for personal reasons or illness, the supervisor should be understanding and accommodating to that need. At the same time, the graduate assistant should attempt to plan personal leave so that it does not interfere with or cause neglect of the duties associated with his or her appointment. Supervisors of graduate assistants are responsible for ensuring that their assistants do not exceed reasonable limits for leave.*

All ISU students with assistantship appointments are employees of ISU and, as such, are allowed the regular university holidays (New Year's Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day, plus one additional day each year determined by the university administration). Absences for other time off must be arranged with the temporary or major professor as outlined above.

### Injuries and Injury Reports

If a student is injured while performing duties as a Graduate Assistant, he or she must submit a *First Report of Injury* as soon as possible. This form is available from ISU's Environmental Health and Safety department or from ISU's Forms page located at <http://www.adp.iastate.edu/forms/other.html>. Usually the University's Worker's Compensation insurance carrier will pay for medical care.

## VIII. Administrative Matters

### ***Administrative Assistance***

The main administrative office for Predictive Plant Phenomics graduate students is the P3 program office in 1077 Roy J. Carver Co-Lab. Office hours are 8 a.m. to 4:30 p.m. Monday through Friday. The P3 Program Coordinator can be contacted at 294-3945 or [p3@iastate.edu](mailto:p3@iastate.edu).

### ***Communications***

It is vital that students maintain good contact with P3 personnel throughout their graduate program. There are a number of ways to do this:

#### **Student Contact Information**

The university maintains a record of each student's current email address, local home address and telephone number, as well as campus address and telephone number. It is important that students update their information through AccessPlus as necessary. Please note that the university does not require student information to be made public and students may opt out of publishing their personal information.

#### **Email**

**Students should check email at least daily**, as this is the **primary means** of keeping students informed about P3 program activities.

#### **Internet**

The P3 website contains most of the information pertaining to ongoing program events, and is updated regularly. Students should visit the website regularly at [www.predictivephenomicsinplants.iastate.edu](http://www.predictivephenomicsinplants.iastate.edu).

#### **Telephone**

Local calls can be made on most campus phones. Long distance calls can be made on University phones only with the prior approval of the person to whom the phone is assigned.

### ***Transportation***

#### **Bicycles**

Bicycle parking regulations keep the campus safe and convenient for everyone. They prevent bicycles from parking in areas of high pedestrian traffic, areas that could cause a safety hazard, or could be disruptive to other people.

1. All bikes on campus must display a bicycle identification sticker issued by ISU.
2. Bicycles must be parked in the bicycle racks provided. Bicycles improperly parked or abandoned may be impounded by cutting and removing a locking device when necessary.

3. Bicycles must not be taken inside any university building except those authorized by the Department of Public Safety.

To assist in recovering lost or stolen bicycles, students should register bicycles at Ames City Hall (515 Clark Avenue) and on-line with the ISU Department of Public Safety (Armory):

[http://www.dps.iastate.edu/wordpress/?page\\_id=88](http://www.dps.iastate.edu/wordpress/?page_id=88)

### Buses

CyRide is the Ames bus system. Students can ride all CyRide routes free of charge upon presentation of a current *ISU* card. During the school year the buses leave from most locations every 20 minutes. Schedules are widely available throughout campus. Further CyRide information can be found at <http://www.cyride.com/>.

### Cars and Parking

The Department of Public Safety (<http://www.dps.iastate.edu/>) has a Parking Division located in 27 Armory. Parking is scarce on campus and students can consult with them about these options:

1. Commuters can register their cars and apply for a permit for one of the two commuter lots on campus. One lot, 29, is located north of Molecular Biology and lot 29B is across Stange from Frederiksen Court.
2. **Commuter Lot at Iowa State Center** Commuters can park at the parking lots at the Iowa State Center for free and take [Cy-Ride's](#) Orange Route into campus. Cars cannot remain in the Iowa State Center lots past 10:00 p.m.
3. **Paying on Campus** Commuters have the option of paying to park each time they come to campus. Pay-by-the-hour machines are available in lot 100 on the east side of campus and lot 21 on the west end. There are also meters in some of the lots, but carefully read the signs and meters as some have time limits that do not accommodate classes.

## ***Technological Resources for the Iowa State community***

Information Technology, <http://www.it.iastate.edu/> provides numerous services and resources to the ISU community. Contact the Solution Center, 195 Durham Center at 294-4000 for additional information or visit their website to learn where computer labs are on campus, what short courses are available, and much, much more.

### Computer Checkout

Information Technology offers laptop checkout for temporary use. For more details, check their webpage here: <http://www.it.iastate.edu/checkout/> .

### High Performance Computing

The High Performance Computing facility in Durham Center provides access to petascale systems that support large-scale computing needs for scientific and instructional endeavors at Iowa State University. View a list of [systems and equipment](#).

## ***Professional Ethics***

It is imperative that every student understand the ethical standards of science and conduct his or her scholarly activities accordingly. Scientists who commit unethical acts, whether from carelessness, ignorance, or malice, quickly lose the respect of the scientific community and may be prevented from receiving funding support. Scientific misconduct includes such activities as:

- falsification of data, ranging from fabrication to deceptively selective reporting, including the purposeful omission of conflicting data with the intent to falsify results
- plagiarism...representation of another's work as one's own
- misappropriation of the ideas of others...unauthorized use of privileged information
- misappropriation of funds or resources for personal gain
- falsification of one's credentials

At ISU, these acts are taken very seriously and constitute "academic misconduct" ([ISU Faculty Handbook](#)). Individuals found guilty of academic misconduct may suffer a variety of penalties, up to and including expulsion from the university.

If a student is aware of a potentially unethical situation, he or she should seek the advice of a trusted professor. Students may also contact the P3 program coordinator, PI or Co-PIs. All discussions with these individuals will be confidential. Alternatively, students may go directly to Associate Vice Provost for Research, who is responsible for investigating charges of academic misconduct on campus. It is very important to protect the rights of the individual whose actions are questioned. Frivolous accusations of misconduct and vicious spreading of rumors are just as unethical as fabrication of data or plagiarism.

## ***Nondiscrimination and Affirmative Action Statement***

### **NON-DISCRIMINATION, EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION STATEMENT IOWA STATE UNIVERSITY (March 14, 2018 Reaffirmation)**

Iowa State University is committed to developing and implementing a program of nondiscrimination and equal opportunity/affirmative action, a responsibility the university accepts willingly because it is the right and just thing to do. Removing societal barriers and promoting an inclusive and welcoming environment is especially critical considering the university's mission of exposing the youth of Iowa, the nation and the world to a multitude of ideas that positively influences their development.

The purpose of the university's non-discrimination and equal opportunity/affirmative action program is to provide a learning, living and working environment free from unlawful discrimination and harassment and to foster a safe and supportive climate for all members of the university community. The university herein commits itself to comply with all federal and state laws, regulations, and orders, including the policies of the Board of Regents, State of Iowa, which pertain to non-discrimination, equal opportunity and affirmative action.

All administrators and personnel providing input into administrative decisions are directed to ensure that all decisions relative to employment, conditions of employment and access to programs, services and benefits are made without unlawful discrimination on the basis of age, color, creed, disability, gender identity, genetic information, national origin, pregnancy, race, religion, sex, sexual orientation, U.S. veteran status or any other applicable legally protected status. In addition, federal regulations require affirmative action programming on behalf of minority group members, women, disabled persons, and Vietnam-era and disabled veterans. No otherwise qualified person will be denied access to, or participation in, any program, activity, service, or the use of university facilities on the basis of factors previously enumerated. Reasonable accommodations will be made to facilitate the participation of person with disabilities in all such activities consistent with applicable federal and state laws, orders and policies.

Further, all administrators and personnel will be responsible for maintaining an environment that is free from unlawful discrimination and harassment and sexual misconduct. Unwelcome behavior that is sufficiently severe, persistent, or pervasive to unreasonably interfere with, limit, or deprive another's ability to participate in university programs, activities, or services is subject to discipline. Retaliation against persons filing complaints, for bringing the violation of this policy forward for review, or for assisting in a review, pursuant to a filed complaint or grievance, is also prohibited.

Questions and/or concerns related to the university's non-discrimination, equal opportunity/affirmative action, anti-harassment and anti-retaliation policies can be direct to Margo Freeman, Assistant Vice President for Diversity, Inclusion, and Equal Opportunity, in the Office of Equal Opportunity, 3410 Beardshear Hall, Iowa State University, Ames, Iowa, 50011-2024, (515) 294-7612. Ms. Foreman directs the university's equal opportunity, affirmative action, non-discrimination, anti-harassment and sexual misconduct programs, and serves as the university's Title IX Coordinator. Individuals who believe they have been subjected to unlawful discrimination, harassment or retaliation may also contact the United States Equal Employment Opportunity Commission, the Department of Labor's Office of Federal Contract Compliance Programs, and/or the Iowa Civil Rights Commission.

Wendy Wintersteen  
President

# FORMS APPENDIX

- A. Request for Schedule Change or Restriction Waiver (Add/Drop Slip)**  
--- This 3-part form is available from the home department office
- B. P3 Travel award application**  
--- apply via the P3 website:  
<https://www.predictivephenomicsinplants.iastate.edu/traineeetravel>
- C. P3 Research Materials & Supplies application**  
--- apply via the P3 website:  
<https://www.predictivephenomicsinplants.iastate.edu/traineeematerials>
- D. Recommendation for Committee Appointment <sup>1</sup>**
- E. Request to Change Committee Appointment <sup>1</sup>**
- F. Program of Study (POS)**  
--- Complete via AccessPlus
- G. Modifications to the Program of Study <sup>1</sup>**
- H. Request for Professional Advancement Grant (Travel or Research) <sup>1</sup>**
- I. Request for Preliminary Examination**  
---This 3-part form is available from the home department office
- J. Application for Graduation**  
--- Complete via AccessPlus
- K. Request for Final Examination**  
---This 3-part form is available from the home department office
- L. Establish an account with ProQuest**  
--- Complete via AccessPlus
- M. Submit Thesis/Dissertation**  
-- Complete via AccessPlus

<sup>1</sup>Available for download from the Graduate College's website, forms page, located at:  
<http://www.grad-college.iastate.edu/forms/forms.html>